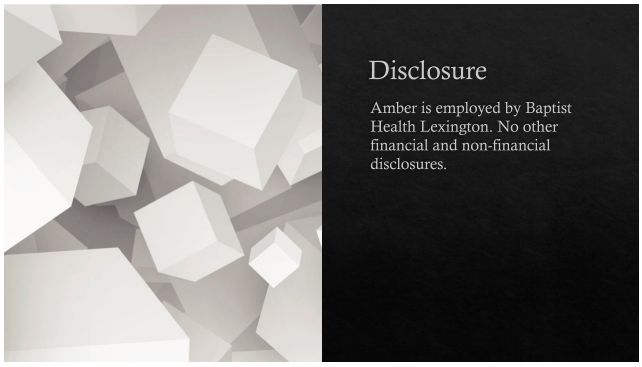
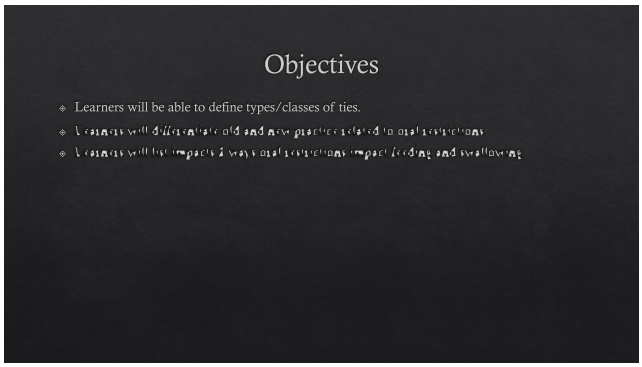
1



2



3

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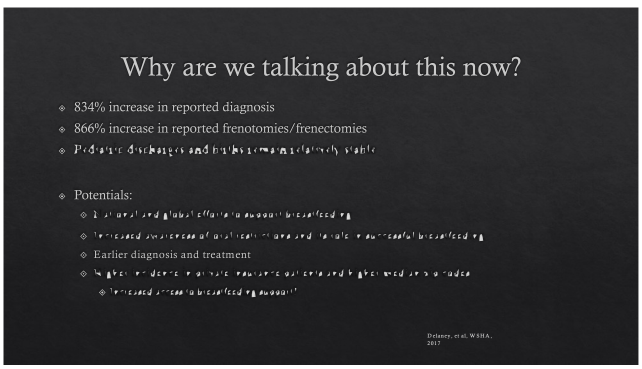
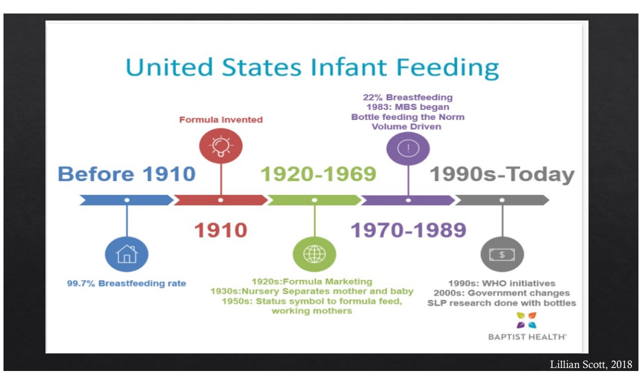
TRENDS

4


Why are we talking about this now?
834% increase in reported diagnosis
866% increase in reported frenotomies/frenectomies
Pediatric discharges and births remain relatively stable
Potentials:
Earlier diagnosis and treatment
Delaney, et al, WSHA, 2017

5


United States Infant Feeding
Formula Invented
22% Breastfeeding
1983: MBS began
Bottle feeding the Norm
Volume Driven
Before 1910
1920-1969
1990s-Today
1910
1970-1989
99.7% Breastfeeding rate
1920s:Formula Marketing
1930s:Nursery Separates mother and baby
1950s: Status symbol to formula feed, working mothers
1990s: WHO initiatives
2000s: Government changes
SLP research done with bottles
BAPTIST HEALTH
Lillian Scott, 2018

6

Treating More than Ties

- Breastfeeding or feeding experiences
- Strong opinions of providers and parents
- Emotions
  - Anxiety
  - Anger
  - Disappointment
- Global Problem, not just local, regional, or national
- Exhaustion of family resources:
  - Time
  - Money
  - Energy and emotional strain
- Plethora of information
  - Peer Circles
  - Social Media
  - Varying professional opinions and preferences

Delaney, et al. 2017, WSHA

7

Some Things Haven't Changed

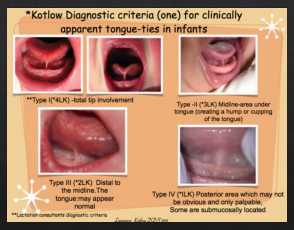
- Types of Ties:
  - Lingual restrictions
  - Labial restrictions
    - Upper and lower
  - Buccal restrictions
    - Upper
    - ? Lower
- Not rated in severity but in placement

8

Frenulum Frenzy

9

Lingual Restrictions



Kotlow

10

Types/Classes of Tongue Ties

- Tongue-ties can be divided into

four types, according to how close to the tip of the tongue the leading edge of the frenulum is attached

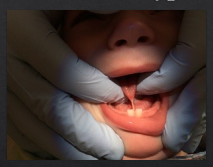
- Type 1: the attachment of the frenulum to the tip of the tongue, usually in front of the alveolar ridge in the lower lip sulcus
- Type 2: two to four mm behind the tongue tip and attaches on or just behind the alveolar ridge
- Type 3: the attachment to the mid-tongue to the middle of the floor of the mouth and is usually tighter and less elastic
- Type 4: extends all the way to the base of the tongue,

and is thick, shiny and very inelastic.

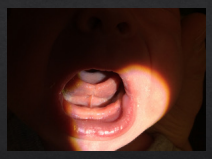
Kotlow, 2011

11

Types of Ties



Class 1 Tongue Tie. This is the classic heart-shaped tongue that most doctors feel is the only real tongue tie. The tie inserts into the tip of the tongue.

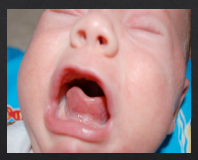


Class 2 Tongue Tie. Considered to be an anterior tie, this tie inserts just behind the tip of the tongue. We don't see a heart-shaped tongue, but the tie is still clearly seen.

12

Types of Ties

Class 3 Tongue Tie. Classified as a (borderline) posterior tongue tie. The distinction between this and a class 4 TT is that the class 3 still has a thin membrane present.



Class 4 Tongue Tie. No thin membrane is present, so this type of tie is the most commonly missed. The front and sides elevate, but the mid-tongue cannot.

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Types

Type	Superior Attachment	Inferior Attachment	Characteristics of frenulum
1 or 100% Tongue tie	Anterior or at the tip of tongue <2mm from tip*	Alveolar ridge or infrequently base of ridge	May be thin or thick and restricted or elastic
2 or 75% Tongue tie	Anterior but just behind tongue tip 2-5mm from tip	Alveolar ridge or base of ridge/floor of mouth	May be thin or thick and restricted or elastic
3 or 50% Tongue tie	Mid tongue 6-10mm from tip	Base of alveolar ridge/floor of mouth	May be thin or thick but less restricted as more free tongue
4 or 25% Tongue tie	Posterior tongue 11-15mm from tip	Floor of mouth/base of alveolar ridge/on ridge	May be thin or thick but less restricted as more free tongue
5 or submucosal Tongue tie	Posterior tongue >15mm from tip	Floor of mouth/base of alveolar ridge	Usually thin and shiny (when the tongue is elevated)
*indicates free tongue			

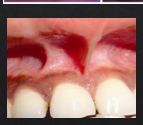
Todd and Hogan, 2015

14

Labial Restrictions

15

Buccal Restrictions



Journal of Clinical Orthodontics 2021
Journal of Oral Rehabilitation 2023

16

What's Up with the Lip Flip?

- Upper lip rolled under/not flanged
- Breast vs. bottle
- Do we flange it manually?
- Is the "Flipple" a real strategy?

17

Lip Tie Implications

- "Breast – Inadequate latch. An infant must flange the lips to create enough suction and adequate seal around the tissue that includes the areola and not just the nipple. It is essential that babies take in enough breast tissue to stimulate the suckling reflex and initiate both the suck receptors in the lips *and* in the posterior oral cavity in order to extract enough milk without fatiguing. When the baby cannot achieve these, painful nursing is also a result. Once a baby is given a nipple shield or bottle, it will often refuse the breast directly at any time. While not always an indicator of a problem, it certainly does signal a baby with an upper lip-tie. It's simply a reminder to flip the lip!"
- "Bottle – Inadequate seal because bottles and nipple shields are inherently stable and adaptations can be made. It is possible to compensate for poor lingual, suction, or jaw compression strategies and often introduced because all other ways of breastfeeding became too painful. Too frustrating or result in poor weight gain and the culprit all along was the upper lip-tie. It is often assumed that a baby can't nurse effectively because they have a lip-tie. However, many children held by teary-eyed mothers who reported difficulty with breast feeding – and no explanation in the chart noted that the child had an upper lip-tie. But upon oral exam it was clear the lip-tie was indeed present and when observing the child feeding, while the tie was at the very least a contributing factor, helping the tie resulted in improved ability to breast feed and progress with solids."

Melanie Potuck, ASHA, 2023

18

Symptoms, Symptoms Everywhere!

- Gassy, fussy, spitty
- "Colicky"
- Fatigue, marked by falling asleep at the breast
- Discomfort by baby and/or mother
- Shorter more frequent feeds
- Poor coordination of suck, swallow, breathe sequences (SSB)
- Inability to take a pacifier
  - Do we care about this?

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Older Baby/Peds Symptoms

- **Spoon Feeding**

1. Inability to clear the spoon with the top lip
2. Inadequate caloric intake due to inefficiency and fatigue
3. Tactile oral sensitivity secondary to limited stimulation of gum tissue hidden beneath the tie
4. Lip restriction may influence swallowing patterns and cause compensatory motor movements which may lead to additional complications

- **Finger Feeding**

1. Inability to manipulate food with top lip for biting, chewing and swallowing
2. Possible development of picky, hesitant or selective eating because eating certain foods are challenging
3. Lip restriction may influence swallowing patterns and using compensatory strategies (e.g. sucking in the cheeks to propel food posteriorly to be swallowed) which may lead to additional complications

20

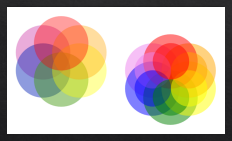
Ties and Oral Hygiene

- **Oral Hygiene & Dental Issues**

1. Early dental decay on upper teeth where milk residue and food is often trapped
2. Significant gap between front teeth
3. Periodontal disease in adulthood
4. Possible changes in dentition with certain compensatory methods to propel bolus posteriorly for swallowing, such as finger sucking

21

Do Ties Symptoms Overlap?



- How do we know if it's lip, tongue, cheeks or all of the above?
- How do we know that it's oral restrictions versus other complications?
- Where do we start?

22

23

Signs and Symptoms of Tongue Tie

- **BABY:**
- the baby keeps losing suction while feeding and sucks in air
- the baby makes a clicking sound when feeding
- the baby fails to gain weight
- the baby cannot put his tongue out beyond his gum or lips
- his tongue cannot lateralize
- the tip of his tongue may be notched or heart-shaped when he cries
- Hypersensitive gag
- the tip may look flat or square instead of pointed

24

Signs and Symptoms for Mom

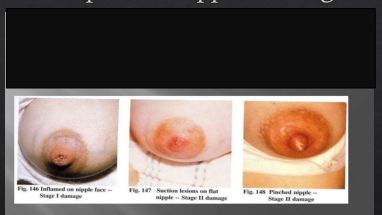
- Signs in mom:
  - •nipple pain and/or erosions
  - •nipple looks pinched, creased, blanched, or abraded after feeds
  - •white stripe at the end of the nipple
  - •painful breasts/vasospasm
  - •low milk supply
  - •plugged ducts
  - •mastitis
  - •recurring thrush
  - •frustration, disappointment, and discouragement with breastfeeding
  - •weaning before mom is ready

25

Nipple Damage

26

Examples of Nipple Damage



The Breastfeeding Atlas, 2013

27

One Size Fits All! Or Does it?

1. How are we diagnosing?
2. How are decisions made?
3. Do all ties need to be released?

28

Where do we start?

- Evaluation by SLP and/or lactation consultant
  - Need to be well versed in clinical assessment of oral feeding skills
- History of mother and baby
- Oral mech exam
  - Anatomy vs. physiology
- Reflexes
- Feeding evaluation
  - Breast vs. bottle
  - NNS sucking

29

Examine the Infant Clinically

Ankyloglossia can be defined in two ways

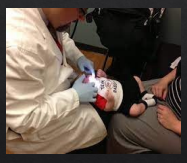
Anatomical and Clinical Appearance

Ability to Function

30

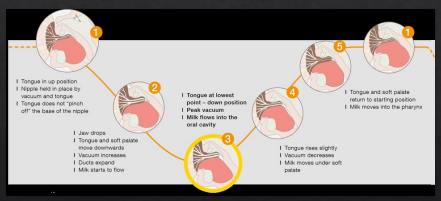
Oral Mechanism Exam

- With gloved hands, roll top lip upwards
- Palpate under tongue to assess for lingual frenulum
- Assess for lateralization of tongue
- Assess for posterior motion of tongue
- Assess Non-nutritive Sucking (NNS) skills
  - With gloved finger assess for posterior has available



31

Sucking Mechanism in Infants



Ramsey et al., 2005

32

New Hype?

- What's up with bodywork and why would we need it?
  - Asymmetry of face, jaw, or head
  - Motor development delays
  - Torticollis symptoms or side preference
  - Breech presentation in utero
  - Cesarean birth
  - Reflux or colic symptoms
  - Latch or feeding issues
  - Sleeping difficulties
  - Hate the car seat

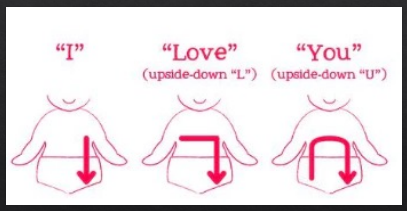
33

Bodywork

- Hands on touch to allow baby's tension to decrease and help reorganize
- Body work prior to releases may lead to improved healing/outcomes

34

I Love You Massage



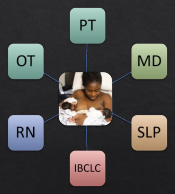
35

"Container Babies"

- More time in swaddle
- Sleeping on back
- Time in swings, bouncers, car seats, and strollers
- Leads to decrease startle, increase plagiocephaly, and decrease in mobility/motor development

36

Tag Team!

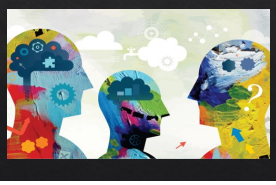


- Chiropractor
- Cranio-sacral Therapist/Cranio-fascial Therapist
- Dietician?
- PARENTS!!!
- Baby
- Child Care providers
- Other family members

37

Reflexes and Feeding

Are there more than rooting and gag?



38

Reflexes and Feeding

- Rooting
  - When baby's cheek is touched the baby [illegible]
  - [illegible] replaced with reaching

39

Reflexes and Feeding

- Startle/Moro
  - When baby hears a loud noise or sudden movement they will extend their arms and legs and pull them back suddenly.
  - Arms and legs may be shaking slightly until this reflex is regulated
  - Often suppressed with consistent swaddling especially during feeding
    - Different for preemies vs. term babies

40

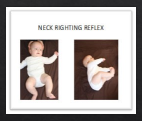
Reflexes and Feeding

- Grasping
  - When you stroke the palm or put your finger in baby's hand they will grasp and hold tightly
  - May be evolutionary based and hold on to mother's hair, jewelry, clothes, etc.

41

Reflexes and Feeding

- Head righting
  - Corrects the orientation of the body when the baby is taken out of normal position



42

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Reflexes and Feeding

- Gag reflex
  - Helps baby not choke
  - In the first 6 months, gag is easily stimulated by finger or object at back of tongue, side of tongue, back of throat or palate
  - 6 months should be integrated as reach time for solids
  - Tied babies have overactive gags?

43

Reflexes and Feeding

- Asymmetrical Tonic Neck Reflex (ATNR)
  - Turn baby's head to one side, the baby will arch their body, extending arm and leg out in a fencing pose.
  - Works on flexion and extension
  - Helpful for feeding positions
  - Integrates around 6 months

44

Reflexes and Feeding

- Stepping
  - If the baby is held upright and the sole of one foot presses on a surface the weight bearing foot will lift and the other foot will lower or move like taking a step
  - Begins to integrate at 2 month

45

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Reflexes and Feeding

- Anatomical Crawling
  - When a baby is placed on the tummy, the baby will assume a crawling position
  - Hips, pelvis, and knees are pulled under the belly, baby extends, [illegible], lifts head to midline, moves head, arms, and legs-right and left

46

Reflexes and Feeding

- Withdrawal
  - Natural protection from pain
  - Prick foot and baby will withdraw foot to avoid pain
  - Continues throughout life

Lisa Lahey, 2023

47

Pregnancy and Birth

- How does this impact feeding?
- Genetics vs. Epigenetics
- Positioning in utero
- Fast birth vs. slow birth
- Delivery vs. c-section
- Body work during pregnancy
- Birth interventions
- Fluid and edema

48

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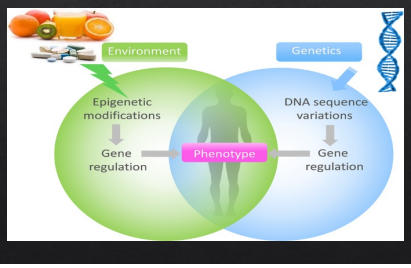
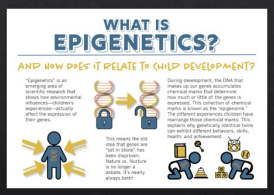
Genetics vs. Epigentics
Why does it matter?



49

Epigentics

1. The definition of epigentics
2. DNA methylation and its role in the body
3. Nutrigenomics - the study of nutrition and genes
4. Methyl genetic nutrition
5. Eating for your genes
6. Water
7. Makeup and clothing
8. Antibiotics
9. Stress
10. Oral development
11. Folic acid supplementation for pregnant women



Stacy Fletcher, OMT., 2017

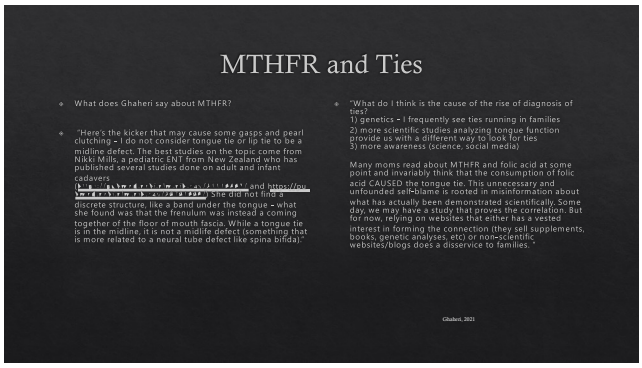
50

MTHFR and Ties

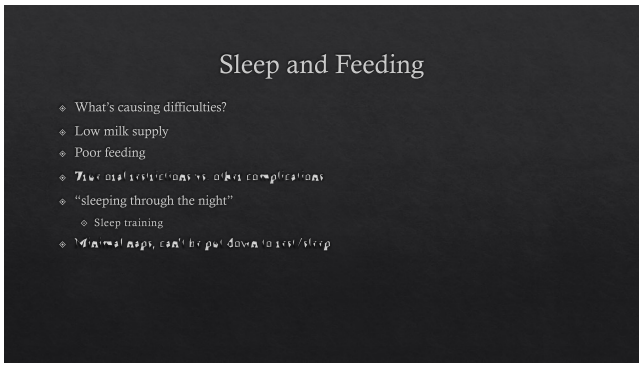
- Increase in homocysteine
- Folate metabolic deficiency
- Avoid nitric oxide use?
- Two components but only one impacts oral restrictions
- "catalyzes the conversion of 5,10-methylenetetrahydrofolate to 5-5-methyltetrahydrofolate, the primary circulatory form of folate, and a cosubstrate for homocysteine remethylation to methionine."
- "only one condition has been definitely shown to be an increased risk in children with MTHFR mutations. women with a variant known as C677T have a slightly increased risk of delivering a child with a neural tube defect like spina bifida."

Smith, 2020

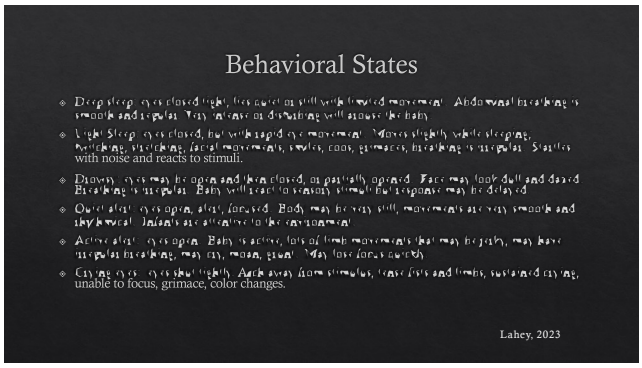
51


MTHFR and Ties
What does Ghaheri say about MTHFR?
"Here's the kicker that may cause some gasps and pearl clutching – I do not consider tongue tie or lip tie to be a midline defect. The best studies on the topic come from Nikki Mills, a pediatric ENT from New Zealand who has published several studies done on adult and infant cadavers (https://pubmed.ncbi.nlm.nih.gov/ and https://pubmed.ncbi.nlm.nih.gov/) She did not find a discrete structure, like a band under the tongue – what she found was that the frenulum was instead a coming together of the floor of mouth fascia. While a tongue tie is in the midline, it is not a midlie defect (something that is more related to a neural tube defect like spina bifida)."
"What do I think is the cause of the rise of diagnosis of ties?
1) genetics – I frequently see ties running in families
2) more scientific studies analyzing tongue function provide us with a different way to look for ties
3) more awareness (science, social media)
Many moms read about MTHFR and folic acid at some point and invariably think that the consumption of folic acid CAUSED the tongue tie. This unnecessary and unfounded self-blame is rooted in misinformation about what has actually been demonstrated scientifically. Some day, we may have a study that proves the correlation. But for now, relying on websites that either has a vested interest in forming the connection (they sell supplements, books, genetic analyses, etc) or non-scientific websites/blogs does a disservice to families."
Ghaheri, 2021

52


Sleep and Feeding
What's causing difficulties?
Low milk supply
Poor feeding
Tie and restrictions vs other complications
"sleeping through the night"
Sleep training
Normal naps, can't be put down to rest/sleep

53


Behavioral States
Deep sleep: eyes closed tight, face quiet or still with limited movement. Abdominal breathing is smooth and regular. Very intense or disturbing will arouse the baby.
Light Sleep: eyes closed, but with rapid eye movement. Moves slightly while sleeping, twitching, stretching, facial movements, smiles, coos, grimaces, breathing is irregular. Startles with noise and reacts to stimuli.
Drowsy: eyes may be open and then closed, or partially opened. Face may look dull and dazed. Breathing is regular. Baby will react to stimuli, but responses may be delayed.
Quiet alert: eyes open, alert, focused. Body may be very still, movements are very smooth and skyrocket. Infant is attentive to the environment.
Active alert: eyes open. Baby is active, lots of limb movements that may be jerky, may have irregular breathing, may cry, moan, grunt. May look around.
Crying: eyes shut tightly. Arms away from stimulus, tense fists and limbs, sustained crying, unable to focus, grimace, color changes.
Lahey, 2023

54

To Oral Motor or Not, That is the Question?

- "Suck training"- is this a speech or lactation thing?
- How do we determine what OPOM exercises we are using?
- Infant Massage
- Rhythmic Movements
- Oral development norms
- Functional vs. "dysfunctional" patterns
- Infant Cues:
  - Engagement vs. disengagement

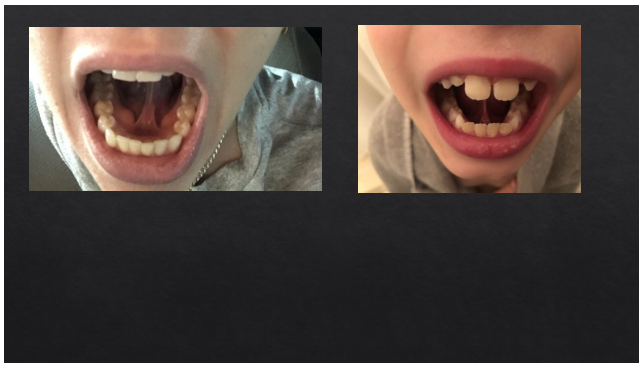
55

Want to see some cool pics?

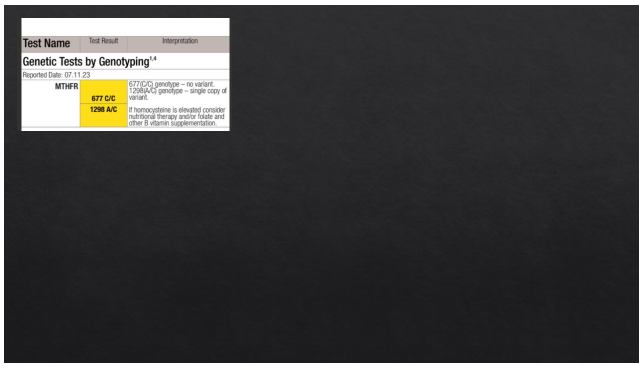
56

57

58



59


Test Name
Test Result
Interpretation
Genetic Tests by Genotyping[1,4]
Reported Date: 07.11.23
MTHFR
677 C/C
1298 A/C
677(C/C) genotype – no variant.
1298(A/C) genotype – single copy of variant.
If homocysteine is elevated consider nutritional therapy and/or folate and other B vitamin supplementation.

60

Health Literacy

- Personal health literacy is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.
- Organizational health literacy is the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

WHY IS THIS SO IMPORTANT?

61

NY Times Article

- INSIDE THE BOOMING BUISNESS OF CUTTING BABIES' TONGUES

62

NY TIMES Article

- [illegible] well-meaning [illegible] bottle-feeding, and more are all [illegible] Level 2 and higher, to back up all these claims). [illegible] with, which can also worsen post-partum depression [illegible] proper tongue-[illegible]-10 questionnaire).
- [illegible] different symptoms [illegible] problem [illegible] earlier post.

Baxter, 2023

63

Mallampati Score

- The Mallampati score is a way of measuring the space within a person's airway. It is a noninvasive test, in which a person sits upright, opens their mouth, and sticks out their tongue. The health care provider then provides a Mallampati score based on whether certain structures in the mouth and throat are visible.
- **Epiglottis:** The epiglottis is a flap of tissue that covers the airway when a person swallows so foods and liquids don't get into the lungs.
- **Soft palate:** The soft palate is the tissue at the back of the roof of the mouth. It moves during talking, swallowing, and to keep food from entering the nasal cavity.
- **Hard palate:** The hard palate is a bony area at the front of the roof of the mouth. The hard palate aids in chewing and speaking.
- **Uvula:** The uvula is a piece of tissue that hangs from the back of the throat. It helps with swallowing and speech.
- **Tonsillar pillars:** The tonsillar pillars are arch-like structures that may be seen on the sides of the back of the throat.
- Although originally devised to improve patient safety during procedures involving a breathing tube, researchers found that a person's Mallampati is also linked to their risk of OSA and its severity. The original Mallampati scoring system has since been modified. The most commonly used Mallampati scoring system is now referred to as the modified Mallampati score.

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Mallampati Score

- The Mallampati score is based on what structures in the mouth and throat are visible to the health care provider when a person's mouth is open and their tongue is shifted forward
- The following scoring system is used to determine a person's modified Mallampati score
- **Class 1:** The soft palate, uvula, and tonsillar pillars can be viewed
- **Class 2:** Just the soft palate and uvula are visible.
- **Class 3:** Only the soft palate and the base of the uvula are visible
- **Class 4:** The hard palate is the only structure visible.
- Some practitioners also include Class 0, which describes when any part of the epiglottis is visible
- People with a score of 3 or 4 are considered to have a narrow airway, which increases their risk of obstructive sleep apnea.

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Evidence Based Practice

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Any Questions?

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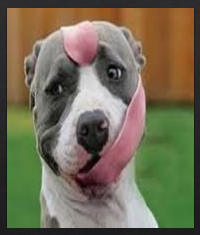
Contact:



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- Bibliography located in course materials

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